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Inspiratory muscle training and its effect on indices of physiological and perceived stress during incremental walking exercise in normobaric hypoxia

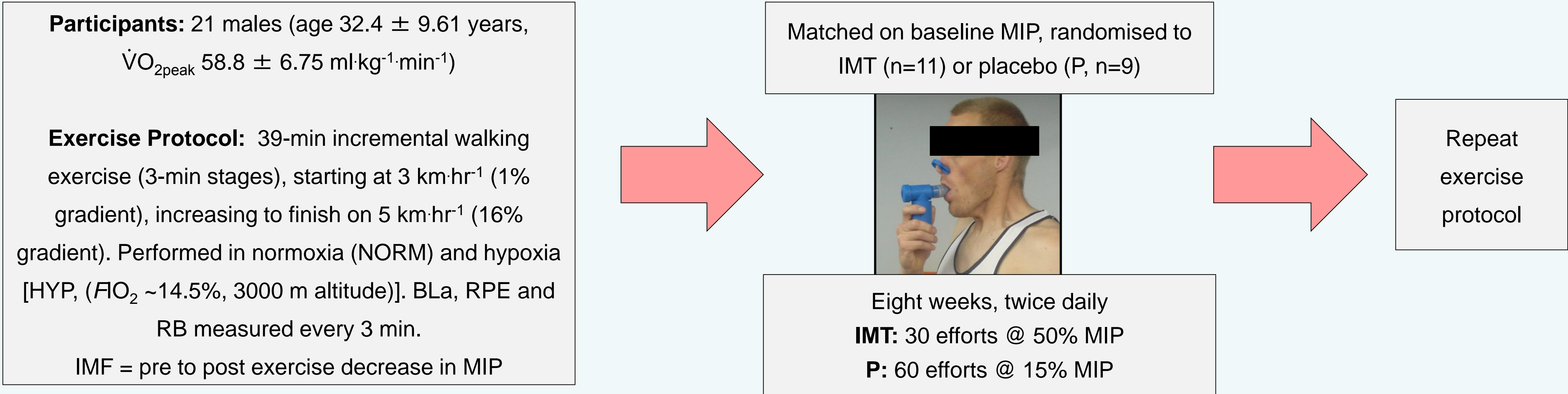
Amanda L. Seims, John P. O'Hara, Roderick, F.G.J. King and Carlton B. Cooke.

AIM: To evaluate the effects of inspiratory muscle training (IMT) on inspiratory muscle fatigue (IMF), blood lactate concentration (BLa), rating of perceived exertion (RPE) and rating of breathlessness (RB) during trekking specific exercise completed in moderate hypoxia (3000 m)

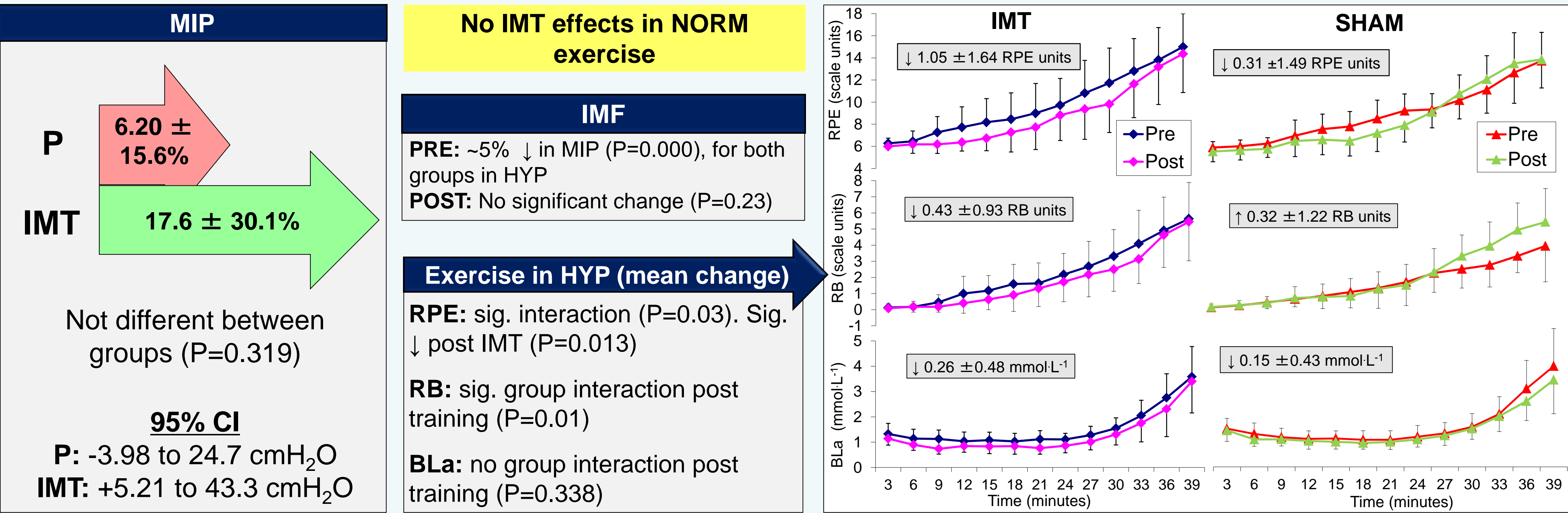
Introduction

The elevated ventilation and reduced O₂ supply in hypoxia increases RB, RPE and BLa during exercise and exacerbates IMF, shown as a reduction in force output of the inspiratory muscles (1). IMF triggers the inspiratory metaboreflex which reduces limb blood flow (2) and may further increase BLa and intensify RPE (1). Reducing IMF can prolong exercise time to exhaustion in hypoxia and reduce RB and RPE (1). Increased inspiratory muscle strength (MIP) following IMT has been shown to attenuate IMF and the metaboreflex (3). Four weeks of IMT significantly increased MIP by ~25% and reduced IMF by 10% and RPE and RB by 13% during high-intensity running to fatigue in normobaric hypoxia [$\dot{V}O_2$ = 14%, 3200 m (4)]. IMT may benefit trekking expeditions at moderate altitude, but this has not been evaluated in controlled conditions of hypoxia using trekking specific exercise

Methods



Findings



Conclusions

IMT may attenuate increased RPE during walking exercise in moderate hypoxia. This may benefit expeditions completed at moderate altitude (~3000 m). The effect of IMT on BLa and RB may be enhanced with severe hypoxia and/or sustained moderate intensity walking exercise where inspiratory fatigue is likely greater.

References

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